

REMARKS

Reconsideration of the above-identified patent application as amended herein is respectfully requested. Claim 1-4 are cancelled herein and replaced by new claims 5-8. Of the new claims, only claim 5 is independent. No new matter has been added.

INFORMATION DISCLOSURE STATEMENT:

A Supplemental Information Disclosure Statement, a form PTO 1449 and a legible copy of the references listed thereon complying with 37 C.F.R. 1.98(a)(2) is submitted in order to permit the Examiner to consider all of the information cited in the Information Disclosure Statement filed November 15, 2001.

IN THE SPECIFICATION:

In the Office Action, the Examiner objected to the disclosure because of certain informalities. The specification is amended herein to correct the informalities noted in the Office Action. No new matter has been added.

IN THE CLAIMS:

In the Office Action, the Examiner objected to claim 4 because of certain informalities. Claim 4 is cancelled herein and replaced by new claim 8 which has been drafted with consideration to the informalities noted in the Office Action.

In addition, the Examiner rejected claims 1-4 under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent 10219949A (JP '949) in view of US Patent 5,849,107 (US '107) to Itoyama et al. Applicants respectfully traverse this ground for rejection.

As discussed on pages 1-2 of the specification, sheet metal panels for a roof covering or wall cladding comprising two cover sheets and an intermediate layer of thermal insulating material are known. Problems arise when it is desired to secure a plane photovoltaic element to the external cover sheet. On the one hand, if the photovoltaic element is secured to the external cover sheet by means of a hot sealing adhesive, as has been done in the prior art, so much heat must be applied to activate the adhesive that there is a danger of destroying the thermal insulating material. On the other hand, securing the photovoltaic element by mechanical means, e.g., by bolts, tends to form leakage points between the photovoltaic element and the external cover sheet. Such leakage points allow humidity to be introduced between the cover sheets and therefore reduce the insulating ability of the intermediate layer. These problems are overcome by means of the present invention.

As set forth in new claims 5-8, the present invention is directed to a sheet metal panel having first and second cover sheets, an intermediate layer made of a thermal insulating material and a photovoltaic element disposed on the external cover sheet. An electric connecting cable is connected to the photovoltaic element and extends through a sealed bore in the sheet metal panel. An improvement of the present invention with respect to the state of the art is that the photovoltaic element is joined to the external

cover sheet by a cold-bonding adhesive (e.g., by a bituminous layer) rather than by mechanical means or a hot adhesive.

New claim 5 recites:

“A sheet metal panel comprising:

...a plane photovoltaic element... being joined to said second cover sheet by a cold-bonding adhesive...”

JP ‘949 discloses a heat insulation roof panel (2) with a heat insulating material (5) interposed between an upper and a lower metal plate (3,4). The solar panel (7) is installed on a recess (6) formed on the upper surface of the upper metal plate to which is connected by special mechanical clamping means consisting of bolts or the like (7f). However, the bolts form points of leakage in the metal plate, and the presence of humidity in the space between the two cover sheet ultimately reduces the quality of the thermal insulating material.

Furthermore, the teaching of JP ‘949 does not allow the transfer of the heat of the solar panel because of the presence of a space (6) at the rear side of the solar panel. Additionally, JP ‘949 fails to disclose an electrical connecting cable passing through a sealed bore in the sheet metal panel as required by claims 5-8.

US ‘107 teaches flexible solar cells (101) fixed mechanically to the metal plates by a surface cover member (108). While US ‘107 discloses an electrical connecting cable (113), it does not disclose this cable extending through a sealed bore in the sheet metal panel. Thus, US ‘107 fails to remedy the deficiencies of JP ‘949 in that it too fails

to disclose or suggest a cold-bonding adhesive used to join the photovoltaic element to a cover sheet.

In order for a claim to be obvious in light of the teachings of the cited references, the prior art must teach or suggest all of the claimed limitations. The combination of JP '949 with US '107 fails to teach "... **being joined to said second cover sheets by a cold-bonding adhesive**" as recited in new claim 5. Nor does the combination show an electric connecting cable passing through a sealed bore in the sheet metal panel as recited in claim 5. The combination of the two cited references does not disclose how to connect the solar cells to the cover plate without destroying the heat insulating ability of the intermediate layer, nor, how to guide the electric connecting cables through sealed bores of the metal panel.

Therefore, the cited prior art, alone or in combination does not suggest or render obvious the claimed invention.

Accordingly, withdrawal of the rejection under 35 U.S.C. 103(a) is respectfully requested.

In light of the foregoing amendments and arguments, the application is now believed to be in proper format for allowance of all claims and a notice to that effect is earnestly solicited.

Please deduct any fees resulting from this Amendment from deposit account number 16-2500 of the undersigned.

Serial No10/000,283

Attorney Docket No.: 20496-290

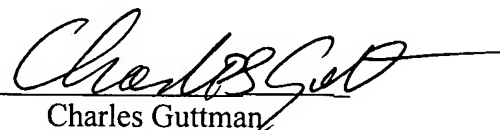
The undersigned attorney requests that the Examiner contact him at the telephone number indicated below if it would help expedite prosecution of this application.

Respectfully submitted,
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